



PTO/SB/21 (04-04)

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**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

Application Number	10/627,537
Filing Date	July 25, 2003
First Named Inventor	Sugar et al.
Art Unit	2685
Examiner Name	Edward F. Urban
Attorney Docket Number	COG-2-0981.01.US

Total Number of Pages in This Submission

**ENCLOSURES (Check all that apply)**

- |   |   |   |
|---|---|---|
| <input checked="" type="checkbox"/> Fee Transmittal Form<br><input checked="" type="checkbox"/> Fee Attached<br><input type="checkbox"/> Amendment/Reply<br><input type="checkbox"/> After Final<br><input type="checkbox"/> Affidavits/declaration(s)<br><input type="checkbox"/> Extension of Time Request<br><input type="checkbox"/> Express Abandonment Request<br><input checked="" type="checkbox"/> Supplemental Information Disclosure Statement<br><input type="checkbox"/> Certified Copy of Priority Document(s)<br><input type="checkbox"/> Response to Missing Parts/Incomplete Application<br><input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53 | <input type="checkbox"/> Drawing(s)<br><input type="checkbox"/> Licensing-related Papers<br><input type="checkbox"/> Petition<br><input type="checkbox"/> Petition to Convert to a Provisional Application<br><input type="checkbox"/> Power of Attorney, Revocation<br>Change of Correspondence Address<br><input type="checkbox"/> Terminal Disclaimer<br><input type="checkbox"/> Request for Refund<br><input type="checkbox"/> CD, Number of CD(s) _____ | <input type="checkbox"/> After Allowance communication to Technology Center (TC)<br><input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences<br><input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)<br><input type="checkbox"/> Proprietary Information<br><input type="checkbox"/> Status Letter<br><input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): |
|---|---|---|

Remarks

Form PTO-1449 w/ copies of sixteen (16) references

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm or Individual name	Anthony L. Venezia	Reg. No. 48,382
	Volpe and Koenig, P.C.	
Signature		
Date	June 23, 2005	

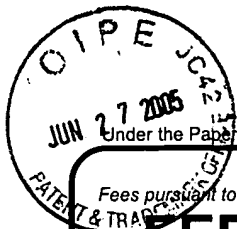
**CERTIFICATE OF TRANSMISSION/MAILING**

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Typed or printed name	Anthony L. Venezia		
Signature		Date	June 23, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

# FEE TRANSMITTAL

## For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ ) 180.00

**Complete if Known**

Application Number	10/627,537
Filing Date	July 25, 2003
First Named Inventor	Sugar et al.
Examiner Name	Edward F. Urban
Art Unit	2685
Attorney Docket No.	COG-2-0981.01.US

**METHOD OF PAYMENT** (check all that apply)☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): \_\_\_\_\_☐ Deposit Account Deposit Account Number: \_\_\_\_\_ Deposit Account Name: \_\_\_\_\_

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**☐ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	_____
Design	200	100	100	50	130	65	_____
Plant	200	100	300	150	160	80	_____
Reissue	300	150	500	250	600	300	_____
Provisional	200	100	0	0	0	0	_____

**2. EXCESS CLAIM FEES**

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

<u>Total Claims</u>	<u>Extra Claims</u>	<u>Fee (\$)</u>	<u>Fee Paid (\$)</u>	<u>Multiple Dependent Claims</u>	<u>Fee (\$)</u>	<u>Fee Paid (\$)</u>
_____	_____	x _____	= 0.00	_____	_____	0.00

HP = highest number of total claims paid for, if greater than 20

<u>Indep. Claims</u>	<u>Extra Claims</u>	<u>Fee (\$)</u>	<u>Fee Paid (\$)</u>
_____	_____	x _____	= 0.00

HP = highest number of independent claims paid for, if greater than 3

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

<u>Total Sheets</u>	<u>Extra Sheets</u>	<u>Number of each additional 50 or fraction thereof</u>	<u>Fee (\$)</u>	<u>Fee Paid (\$)</u>
_____ - 100 = _____	/ 50 = _____	(round up to a whole number) x _____	= 0.00	_____

**4. OTHER FEE(S)**

Non-English Specification, \$130 fee (no small entity discount)

Other: Supplemental Information Disclosure Statement

180.00

**SUBMITTED BY**

Signature		Registration No. (Attorney/Agent) 48,382	Telephone 215-568-6400
Name (Print/Type)	Anthony L. Venezia	Date June 23, 2005	

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In the **PATENT APPLICATION** of:

Sugar et al.

**Application No.:** 10/627,537

**Confirmation No.:** 3568

**Filed:** July 25, 2003

**For:** SYSTEM AND METHOD FOR  
MULTIPLE-INPUT MULTIPLE-OUTPUT  
(MIMO) RADIO COMMUNICATION

**Group:** 2685

**Examiner:** Edward F. Urban

**Our File:** COG-2-0981.01.US

**Date:** June 23, 2005

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

06/28/2005 SHASSEN1 00000033 10627537

01 FC:1806

180.00 OP

Sir:

Further to Applicants' Duty of Disclosure pursuant to 37 C.F.R. §1.56, Applicants wish to bring to the Examiner's attention the material cited on the enclosed PTO-1449 form. Newly cited documents are indicated by an asterisk (\*). Copies of the newly cited documents are enclosed.

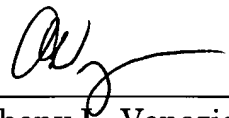
Pursuant to 37 C.F.R. §1.98(a)(2)(ii), copies of the cited U.S. publications and/or patent documents have not been included. Copies of previously cited documents are also not included.

**Applicant:** Sugar et al.  
**Application No.:** 10/627,537

It is respectfully requested that the Examiner consider these documents and return an initialed copy of the PTO-1449 form indicating his consideration of the cited materials.

Respectfully submitted,

Sugar et al.

By   
Anthony L. Venezia  
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(215) 568-6400

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Philadelphia, PA 19103

ALV/ks  
Enclosures (17)



FORM PTO-1449  U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE  INFORMATION DISCLOSURE STATEMENT BY APPLICANT  (Use several sheets if necessary)	ATTY. DOCKET NO. COG-2-0981.01.US	SERIAL NO. 10/627,537
	APPLICANT Sugar et al.	
	FILING DATE July 25,2003	GROUP 2685

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	*	4,121,221	10/1978	Meadows			
	*	4,599,734	07/1986	Yamamoto			
	*	4,639,914	01/1987	Winters			
	*	5,274,844	12/1993	Harrison et al.			
		5,394,435	02/1995	Weerackody			
		5,437,055	07/1995	Wheatley, III			
	*	5,457,808	10/1995	Osawa et al.			
	*	5,491,723	02/1996	Diepstraten			
	*	5,493,307	02/1996	Tsujimoto			
	*	5,507,035	04/1996	Bantz et al.			
	*	5,539,832	07/1999	Weinstein et al.			
	*	5,570,366	10/1996	Baker et al.			
	*	5,577,265	11/1996	Wheatley, III			
	*	5,610,617	03/1997	Gans et al.			
	*	5,752,173	05/1998	Tsujimoto			
	*	5,761,193	06/1998	Derango et al.			
	*	5,761,237	06/1998	Petersen et al.			
	*	5,812,531	09/1998	Cheung et al.			
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	*	5,912,921	06/1999	Warren et al.			
	*	5,930,248	07/1999	Langlet et al.			
		5,982,327	11/1999	Vook et al.			
		6,008,760	12/1999	Shattil			
	*	6,023,625	02/2002	Myers Jr.			
	*	6,037,898	03/2000	Parish et al.			

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	*	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	*	6,038,272	03/2000	Golden			
	*	6,044,120	03/2000	Bar-David et al.			
		6,058,105	05/2000	Hochwald et al.			
	*	6,091,934	07/2000	Berman et al.			
		6,097,771	08/2000	Foschini			
	*	6,118,788	09/2000	Kermani			
		6,122,260	09/2000	Liu et al.			
	*	6,124,824	09/2000	Xu et al.			
		6,141,393	10/2000	Thomas et al.			
	*	6,141,567	10/2000	Youssefmir et al.			
	*	6,144,651	11/2000	Rinchuso et al.			
		6,144,711	11/2000	Raleigh et al.			
	*	6,147,985	11/2000	Bar-David et al.			
		6,157,340	12/2000	Xu et al.			
	*	6,157,843	12/2000	Derango et al.			
	*	6,177,906	01/2001	Petrus			
	*	6,185,440	02/2001	Barratt et al.			
	*	6,195,045	02/2001	Xu et al.			
		6,211,671	04/2001	Shattil			
		6,252,548	06/2001	Jeon			
	*	6,252,884	06/2001	Hunter			
	*	6,266,528	07/2001	Farzaneh			
	*	6,295,026	09/2001	Chen et al.			
		6,298,092	10/2001	Heath, Jr.			
	*	6,307,882	10/2001	Marzetta			
	*	6,314,147	11/2001	Liang et al.			

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,317,466	11/2001	Foschini et al.			
		6,327,310	12/2001	Hochwald et al.			
		6,331,837	12/2001	Shattil			
	*	6,349,219	02/2002	Hochwald et al.			
		6,351,499	02/2002	Paulraj et al.			
		6,362,781	03/2002	Thomas et al.			
	*	6,369,758	04/2002	Zhang			
	*	6,370,182	04/2002	Bierly et al.			
		6,377,631	04/2002	Raleigh			
	*	6,377,636	04/2002	Paulraj et al.			
		6,377,819	04/2002	Gesbert et al.			
		6,400,699	06/2002	Airy et al.			
		6,400,780	06/2002	Rashid-Farrokhi et al.			
		6,442,214	08/2002	Boleskei et al.			
		6,452,964	09/2002	Yoshida			
	*	6,462,709	10/2002	Choi			
	*	6,463,295	10/2002	Yun			
		6,473,467	10/2002	Wallace et al.			
	*	6,522,898	02/2003	Kohno et al.			
	*	6,549,786	04/2003	Cheung			
	*	6,570,929	05/2003	Eriksson			
	*	6,584,161	06/2003	Hottinen			
		6,636,568	10/2003	Kadous			
	*	6,646,600	11/2003	Vail et al.			
	*	6,684,064	01/2004	Kazakevich et al.			
	*	6,687,492	02/2004	Sugar et al.			

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,771,706	08/2004	Ling et al.			
	*	2001/0012764	08/2001	Edwards et al.			
		2001/0015994	08/2001	Nam			
		2001/0015999	08/2001	Nam			
		2001/0046255	11/2001	Shattil			
		2001/0053143	12/2001	Li et al.			
		2002/0001316	01/2002	Hornsby et al.			
	*	2002/0024975	02/2002	Hendler			
	*	2002/0034191	03/2002	Shattil			
		2002/0039884	04/2002	Raynes et al.			
		2002/0064246	05/2002	Kelkar et al.			
		2002/0067309	06/2002	Baker et al.			
		2002/0072392	06/2002	Awater et al.			
		2002/0085643	07/2002	Kitchener et al.			
	*	2002/0102950	08/2002	Gore et al.			
	*	2002/0111142	08/2002	Klimovitch			
		2002/0118781	08/2002	Thomas et al.			
		2002/0122383	09/2002	Wu et al.			
		2002/0122501	09/2002	Awater et al.			
		2002/0127978	09/2002	Khatri			
		2002/0136170	09/2002	Struhsaker			
		2002/0141355	10/2002	Struhsaker et al.			
	*	2002/0147032	10/2002	Yoon et al.			
	*	2002/0158801	10/2002	Crilly, Jr. et al.			
	*	2002/0159537	10/2002	Crilly, Jr.			
	*	2002/0172186	11/2002	Larsson			

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	*	2002/0172269	11/2002	Xu			
		2002/0191535	12/2002	Sugiyama et al.			
		2002/0196842	12/2002	Onggosanusi et al.			
	*	2003/0002450	01/2003	Jalali et al.			
	*	2003/0022693	01/2003	Gerogiokas et al.			
	*	2003/0032423	02/2003	Boros et al.			
	*	2003/0048761	03/2003	Jarett			
		2003/0072379	04/2003	Ketchum			
		2003/0072382	04/2003	Raleigh et al.			
		2003/0108117	06/2003	Ketchum et al.			
	*	2003/0114108	06/2003	Frecassetti et al.			
		2003/0125040	07/2003	Walton et al.			
		2003/0125090	07/2003	Zeira			
	*	2003/0130012	07/2003	Brunner et al.			
		2003/0139194	07/2003	Onggosanusi et al.			
	*	2003/00162566	08/2003	Shapira et al.			
		2003/0161282	08/2003	Medvedev et al.			
	*	2003/0165189	09/2003	Kadous			
	*	2003/0181165	09/2003	Sugar et al.			
	*	2003/0181171	09/2003	Sim et al.			
		2003/0185309	10/2003	Pautler et al.			
		2004/0013212	01/2004	Benesty et al.			
	*	2004/0023621	02/2004	Sugar et al.			
	*	2004/002364	01/2004	Trikkonen et al.			
	*	2004/0184398	09/2004	Walton et al.			

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

FOREIGN PATENT DOCUMENTS								
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	*	01/45300	06/2001	WO				
		02/03568	01/2002	WO				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
		"BLAST High-Level Overview", Lucent Technologies, July 18, 2000.
	*	Aziz et al., "Indoor Throughput and Range Improvements Using Standard Complaint AP Antenna Diversity in IEEE 802.11a and ETSI HIPERLAN/2", Vehicular Technology Conference, 2002, VTC 2001, October 7-11, 2001, IEEE VTS 54 <sup>th</sup> , Vol. 4, pp. 2294-2298.
		Bablan et al., " Optimum Diversity Combining and Equalization in Digital Data Transmission with Applications to Cellular Mobile Radio-Part II: Numerical Results"; May 1992; IEEE Transactions on Communications, vol. 30, No. 5; pp. 895-907.

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		APPLICANT Sugar et al.	
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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
	*	Briesemeister et al., "Role-Based Multicast in Highly Mobile but Sparsely Connect Ad-Hoc Networks"; First Annual Workshop on Mobile Ad Hoc Networking & Computing; pp. 45-50; August 2000.	
	*	Brunner et al., "Downlink Beamforming for WCDMA Based on Uplink Channel Parameters"; Proceedings of 3 <sup>rd</sup> European Personal Mobile Conference (EPMCC '99), March 1999, pp. 375-380.	
	*	Chiu et al., "OFDM Receiver Design", EE225C, Fall 2000, University of California, Berkeley.	
	*	Chizhik et al., "Keyholes, Correlations, and Capacities of Multielement Transmit and Receiver Antennas", IEEE Transactions on Wireless Communications, Vol., 1, No. 2, April 2002, pp. 361-368.	
	*	Choi et al., "MISO CDMA Transmission with Simplified Receiver for Wireless Communication Handsets", IEEE Transactions on Communications, Vol. 49, No. 5, May 2002.	
		Chuah et al., "Capacity of Multi-Antenna Array Systems in Indoor Wireless Environment", November 1998, IEEE Globecom.	
		Golden et al., "Detection Algorithm and Initial Laboratory Results Using V-BLAST Space-Time Communication Architecture", Electronic Letters, January 7, 1999, Vol. 35, No. 1.	
		Golden et al., "V-BLAST: A High Capacity Space-Time Architecture for the Rich-Scattering Wireless Channel", Bell Laboratories, Lucent Technologies, Proc. Int'l Symposium on Advanced Radio Technologies, Boulder, CO, September 10, 1998.	
	*	Heath et al., "A Simple Scheme for Transmit Diversity Using Partial Channel Feedback", Signals, Systems & Computers, Conference Record of the Thirty-Second Asilomar Conference, November 1-4, 1998; vol. 2; pp. 1073-1078.	
	*	Irmer et al., "MISO Concepts for Frequency-Selective Channels", 2002 International Zurich Seminar on Broadband Communications Access, February 19-21, 2002.	
	*	Iserte et al., "Iterative Algorithm for the Estimation of Distributed Sources Localization Parameters", SSP 2001, 11 <sup>th</sup> IEEE Workshop on Statistical Signal Processing, August 2001.	

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
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